

# Rheumatoid Arthritis

## Operations on the Hand for Improvement of Function

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A NUMBER of surgical procedures are available for improving the function of hands that are crippled by rheumatoid arthritis. In the past, it has been the policy to wait until the disease has burnt itself out before considering an operation lest the procedure exacerbate the condition. However, it has been my experience that an operation can help arrest the disease process if it is carried out before severe destruction of the joints has taken place. It is indeed satisfying to see the improvement in function, the relief of pain and the great psychological lift to the patient that can be brought about by such an operation.

The early change that sometimes develops in the hands of patients with rheumatoid arthritis is swelling of the metacarpal-phalangeal joints. During the early phase, injection of the joints with hydrocortisone and the application of functional bracing may be of some value. Bracing is of little corrective value once deformities have developed, however, for it does not reverse contractures that have already occurred.

It is of great advantage to treat these patients with a team concept when possible. The team should consist of a surgeon, a rheumatologist or qualified internist, and an orthotist (brace maker). Careful evaluation must be carried out before operation to avoid operative and postoperative problems.

Unless the patient is hopeful and interested in improving his condition, the operation is doomed to failure. Postoperative management requires diligent care by the surgeon and constant work by the patient and physical therapist to improve the motion and power of the hand.

### ULNAR DRIFT DEFORMITY

The most common deformity that develops in the hand is ulnar drift. It causes diminished gripping power and loss of ability to extend the fingers completely. Sometimes it is an extremely disabling condition, but most patients learn to live with this deformity. In selected cases, operative correction

• Once the deformities of rheumatoid arthritis of the hand begin to develop, conservative management will not prevent their further development. The ulnar drift of the fingers can be improved considerably by a surgical operation, especially if performed early. Experience has shown that an operation performed during the active stage of the disease does not cause exacerbation of symptoms. The results of operations have been encouraging with regard to return of function, decrease in pain and improved appearance of the hand.

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### *Treatment by Synovectomy and Tendon Transplants*

The operative procedure consists of a transplant of the extensor tendons to correct the ulnar drift. First, a transverse incision is made through the skin to expose the extensor mechanism. The transverse fibers of the extensor hood are divided so that the capsule and synovium are exposed. (They are usually found to be decidedly hypertrophied.) Next, the synovium is removed from the joint, which exposes the articular cartilage. The collateral ligaments are left intact to prevent instability of the joint. Then the extensor tendon is repositioned over the dorsum of the joint and sutured into place. In order to stabilize the fingers further and to provide an active, corrective force, the indicis propius tendon is removed from the hood and transplanted to the first dorsal interosseus tendon by passing it beneath the common extensor. If the tendon is passed over the top of the common extensor, it will tend to bind down and not slide freely.

Cutting the interosseus muscles on the ulnar side of the fingers is helpful. The muscles are the first volar interosseus, the third dorsal interosseus, the fourth dorsal interosseus and the abductor digiti quinti brevis muscles, and they are cut at their musculotendinous junctions. To correct pronounced ulnar deviation of the fifth finger that has been caused by contracture, after the digiti quinti brevis muscle is cut the extensor digiti quinti is removed from the hood and passed beneath the common extensor to the radial side of the fifth finger. It is

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then sutured into the transverse fibers of the extensor hood to provide a dynamic correcting force.

A pressure dressing is applied with an ulnar and volar splint to prevent the drift. Since the dressing becomes looser with the decrease in swelling of the hand postoperatively the fingers must be rewrapped after a few days to prevent ulnar drifting.

The fingers are mobilized two weeks after the operation, and bracing is applied when the wound is well healed. I have noted no difficulty with healing despite the patients' having received large doses of cortisone during operation and afterward.

#### *Treatment by Arthroplasty*

If the disease process has produced stiffness of the metacarpal-phalangeal joints with a complete dislocation of these joints, synovectomy alone will not give a satisfactory result. Removal of the synovium will be beneficial, but as contraction has drawn the phalanx beneath the metacarpal head, extension of the finger is impeded. In such cases arthroplasty of the joint must be considered.

The metacarpal head is shortened and reshaped to allow reduction of the dislocation of the metacarpal phalangeal joints. The articular cartilage should not be removed from the proximal phalanx, for without it the joints would fuse spontaneously. The tendons are then transplanted as in synovectomy. A Kirschner wire inserted from the metacarpal into the phalanx fixes the finger in a position of function, and it is held that way for two weeks. The scarring that occurs in that time gives a degree of stability to the fingers when the Kirschner wires are removed. Paraffin baths and active exercise are then begun. Postoperative bracing is of value to increase the range of motion.

#### **FINGER DEFORMITIES**

One of the common deformities of the hand brought about by rheumatoid arthritis is the "swan neck" formation caused by hyperextension of the proximal interphalangeal joint and flexion of the distal interphalangeal joint. Since it prevents flexion of the fingers for grasping, it seriously limits the

function of the hand. Often this condition may be improved by intrinsic release through removal of the oblique fibers of the hood. Removing these fibers on both sides of the finger, rather than on the ulnar side only, improves the function without much sacrifice of stability. The test for complete correction at the time of operation is to extend the metacarpal phalangeal joint to 180 degrees, and flex the proximal interphalangeal joint to 90 degrees. If the finger does not bend to 90 degrees, the incision should be carried more proximally, up to the transverse fibers of the hood and distally over the proximal interphalangeal joint to allow more flexion. After immobilization in plaster for approximately five days after operation, bracing is used to maintain the correction. If the central extensor tendon slip is contracted, a lengthening of the slip may be of considerable value.

Another fairly common deformity in the rheumatoid patients is ankylosis of the proximal interphalangeal joints in severe flexion, which prevents the patient from holding objects in his hand. This involves most often the fourth or fifth finger. The best operation for patients with this deformity is to fuse the fingers in a position of function with the proximal interphalangeal joints at an angle of about 45 degrees.

#### *Tenosynovitis of Flexor Tendons*

A number of patients have limitation of flexion of the fingers which is the result not of involvement of the joint but of the flexor tendons. At operation, decided swelling of the tendon sheaths and hypertrophy of the synovial tissue about the tendon can be seen. Excision of the synovial tissue and splitting of the tendon sheath returns a normal range of motion to the finger. Often there is a bulbous involvement of the flexor digitorum profundus just beyond the point at which it passes through the opening of the sublimis. In such cases either the swollen tissue should be excised or the sublimis opening enlarged. Otherwise, triggering and snapping of the fingers will continue postoperatively.

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